REMARKS

In response to the outstanding Office Action, the specification and claims of this application have been amended, as discussed in more detail below.

Accompanying this amendment is an Information Disclosure Statement bringing to the Examiner's attention some prior art references recently cited by the European Patent Office in connection with a corresponding International or PCT application. None of the references cited in the European search were specifically applied against any claims, but were indicated to be only of background interest. It is submitted that the claims of this application are also all fully distinguished from these references.

In paragraph 1 of the Office Action, the Examiner has objected to the drawings under 37 CFR 1.83(a), arguing that "a plurality of electrical contacts equal in number to the number of electromagnets", as claimed in claim 3, was not shown in the drawings. This argument is incorrect. The cut away view of the motor in Figure 1 shows one pair of diametrically opposed electrical contacts 38, while Figure 3 illustrates the arrangement of the contacts 38 at spaced intervals in a ring on insulating pad 40, with wiper blade 44 contacting two diametrically opposed pairs of the contacts 38. This arrangement is also described in paragraph [0015] and [0016]. Figure 3 clearly shows that the number of electrical contacts 38 is equal to the number of electromagnets 20. Therefore, it is submitted that no amendment to the drawings is necessary, and that the objection in paragraph 1 be reconsidered and withdrawn. If this objection is not withdrawn, it is respectfully requested that the Examiner explain why the illustration of the ring of electrical contacts 38 in Figure 3 is not considered to be sufficient to show this feature of the invention.

In paragraph 2, the Examiner has requested amendment to paragraph [0001] to state that the parent application is now abandoned. This change has been made in the foregoing amendment.

Finally, in paragraph 3, the Examiner has rejected all of the claims as anticipated by U.S. Patent No. 3,124,733 of Andrews. This rejection is hereby traversed, and it is submitted that amended claims 1 and 3 are both fully distinguished from Andrews, along with claims 2, 5 and 6 which depend from claim 1 and claim 4 which depends from claim 3.

For a reference to anticipate a claim, the reference must include each and every claimed feature. Andrews describes a permanent magnet motor in which electromagnets are arranged in a ring and each electromagnet comprises two coils 40 and 42, associated with a respective pole piece 36, and the coils 40 and 42 energized alternately in order to give the pole piece alternating north and south polarity (column 3, lines 6 to 14). There are six coils 40 and six coils 42, so that each of the six pole pieces 36 is associated with one coil 40 and one coil 42. The coils are connected together in only **two** separate circuits, as stated in column 4, lines 58 to 67, such that north coils 40b,40d and 40f are connected in series with south coils 42a, 42c, and 42e, while south coils 40a,40c, and 40e are connected in series with north coils 42b, 42d, and 42f. These sets are energized alternately, either with a time sequence or with a commutator arrangement as illustrated in Figures 11 and 12. The rotor member 12 is not an elongate, linear member having only two opposite ends extending from the shaft in opposite directions. Instead, it is a generally star-shaped member having a series of alternating, radially extending poles 30 (see Figures 2,3,9,10, 12, 16) of alternating polarity (see column 2, lines 53 to 57). The two sets of coils are energized alternately so as to attract all of the opposing poles 30 on the rotor to the next set of opposing pole pieces.

In Andrews' arrangement, the pole pieces around the entire ring are **all** alternately energized to have a north and then a south polarity, such that at any one time, the pole pieces are energized N, S, N, S, N, S around the entire ring. Since the poles 30 of the rotor are of permanent, alternating, north and south polarity, this means that as soon as the pole piece polarity is reversed (for example from the condition illustrated in Figure 12), the poles of the rotor will each be repelled from the pole piece they are currently adjacent, and attracted to the next pole piece around the ring.

This is completely different, and much more complex, than the arrangement of this invention, as defined in amended claim 1. In this invention, the rotor member is a single, linear member having only two opposite ends which can be positioned adjacent only two opposed electromagnets at any one time. The switching assembly is arranged to connect the power supply to successive pairs of opposed electromagnets in turn, unlike Andrews arrangement where power is always connected to all of the electromagnets. In the arrangement of the present invention, unlike Andrews, opposing pairs of electromagnets are activated in sequence around the ring as the contact wiper rotates.

Thus, Andrews lacks a number of the features claimed in amended claim 1, and does not anticipate this claim. For example, Andrews does not describe or suggest an elongate, linear rotor member having only two opposite ends which can be located adjacent only two diametrically opposed electromagnets at any one time. Instead, the rotor in Andrews has plural pairs of diametrically opposed poles which are positioned adjacent successive pairs of opposed pole pieces around the entire ring. Secondly, Andrews has no switching assembly which connects successive pairs of diametrically opposed electromagnets in turn to the power supply. Instead, in Andrews, coils around the entire ring are connected together for joint energization, as stated in column 4,

lines 58 to 65. Rather than connecting only two diametrically opposed pairs of electromagnets to a power supply, all of the coils are connected to the power supply at all times, with the polarity of alternating pole pieces simply being reversed in a time sequence or by a commutator. The arrangement of amended claim 1 is not suggested in any way by the teachings of Andrews.

It is therefore submitted that amended claim 1 is fully distinguished from Andrews, and reconsideration and reversal of the rejection based on this reference is respectfully requested in the light of the foregoing amendment and argument.

Claims 2 to 6 depend from amended claim 1 and are distinguished from Andrews for the same reasons as claim 1, and additionally since these claims define other features unsuggested by this reference and all other cited references.

Referring to claim 3, Andrews does not suggest an arrangement in which each opposing pair of electrical contacts is electrically connected to only one opposing pair of electromagnets in the ring, in a circuit separate from all other circuits (see Figure 3 and description in paragraph [0016], page 5). Instead, as indicated in Figure 10, alternate contacts 308a are connected in one circuit while alternate contacts 308b are connected in another, while brush 306 connects the power supply alternately to the contacts 308a and the contacts 308b. Diametrically opposed contacts 308a and 308b are not connected together in a circuit. There is also no linear, elongate contact wiper mounted at the central axis so as to successively contact diametrically opposed pairs of contacts. Instead, a rotary brush 306 rotates to contact single commutator segments 308 in turn (see Figure 10), not diametrically opposed pairs of commutator segments. Finally, Andrews does not suggest a plurality of separate electromagnet circuits, each circuit connecting a pair of opposite electromagnets with a pair of diametrically opposed contacts, so that, as the wiper blade rotates around a full circle,

each opposed pair of electromagnets is activated in turn. Such an arrangement is neither described nor suggested by Andrews.

It is therefore submitted that amended claim 3 is also fully distinguished from Andrews, and reconsideration and reversal of the rejection of this claim is respectfully requested.

Claim 4 depends from claim 3 and is distinguished from Andrews for the same reasons as amended claims 1 and 3. Claims 2, 5 and 6 depend from amended claim 1 and are distinguished from Andrews for the same reasons as claim 1. Also, referring to claim 6, each electromagnet in Andrews has a core and two coils or windings 40,42, not a single winding.

It is believed that the foregoing amendment and argument deals with all outstanding grounds of objection and rejection, and that this application should now be in condition in all respects for allowance. Early notice to this effect is earnestly solicited. If there are any outstanding objections which could be dealt with by means of a telephone interview, the Examiner is encouraged to contact the undersigned representative.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

Page 1, paragraph [0001] is amended as follows:

[0001] This application is a Continuation-In-Part of my Application Serial No. 09/500,938 filed April 17, 2000, now abandoned.

IN THE CLAIMS

Claims 1 and 3 are amended as follows:

1. (Amended) An electromagnetic motor, comprising:

an outer housing having a central axis and opposite end walls;

a shaft rotatably mounted in the housing to extend along the central axis and projecting out through one end wall of the housing;

a plurality of electromagnets extending parallel to the shaft and mounted at spaced intervals in an annular ring centered on the central axis and spaced radially outwardly from the shaft;

a[n] single, elongate, linear rotor member of ferromagnetic material secured to the shaft and projecting radially outwardly from the shaft in two opposite directions to extend up to the annular ring of electromagnets, the rotor having only two opposite ends located adjacent the ring of electromagnets, whereby the rotor ends are located adjacent only two diametrically opposed electromagnets at any time as the rotor rotates;

a power supply; and

a switching assembly for connecting the power supply to successive pairs of diametrically opposed electromagnets in order to [attract] activate each pair of

diametrically opposed electromagnets in sequence around the ring, such that the opposite ends of the rotor are attracted to successive activated opposed pairs of electromagnets in turn around the ring, whereby the rotor and shaft are rotated in a predetermined direction.

3. (Amended) The motor as claimed in claim 1, wherein the switch assembly [includes] comprises a plurality of electrical contacts equal in number to the number of electromagnets, the contacts being arranged in the housing in an annular ring centered on the central axis, the contacts being positioned in diametrically opposed pairs, and a linear, elongate contact wiper rotatably mounted at the central axis so as to extend radially in opposite directions from the axis and to successively contact each pair of diametrically oppos[ite]ed contacts [in] around the ring in sequence, each opposing pair of contacts being electrically connected to a respective opposing pair of electromagnets in a respective circuit separate from all other circuits in the switch assembly, and the wiper being connected to the power supply, whereby diametrically opposed pairs of electromagnets are activated in sequence around the ring in order to attract the rotor member to the next successive adjacent opposed pair of electromagnets in turn around the ring.